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*Technical Specification*

**LTE;**
**Evolved Universal Terrestrial Radio Access Network (E-UTRAN);**
**M1 Data Transport**
**(3GPP TS 36.445 version 9.0.0 Release 9)**

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# Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

# 1 Scope

The present document specifies the standards for user data transport protocols over the E-UTRAN M1 interface.

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] [FFS GTP-U is the reference; final TS reference requires further assessment.]

[3] IETF RFC 768 (August 1980): "User Datagram Protocol".

[4] IETF RFC 2474 (December 1998): "Definition of the Differentiated Services Field (DS Field) in the Ipv4 and Ipv6 Headers".

[5] IETF RFC 2460 (December 1998): "Internet Protocol, Version 6 (IPv6) Specification".

[6] IETF RFC 791 (September 1981): "Internet Protocol".

[7] IETF RFC3376, 'Internet Group Management Protocol, Version 3', October 2002.

[8] IETF RFC3810, 'Multicast Listener Discovery Version 2 (MLDv2) for IPv6', June 2004.

# 3 Definitions, symbols and abbreviations

## 3.1 Definitions

For the purposes of the present document, the terms and definitions given in TR 21.905 [1] and the following apply. A term defined in the present document takes precedence over the definition of the same term, if any, in TR 21.905 [1].

**M1:** interface between an eNB and an EPC for MBMS data delivery, providing an interconnection point between the EUTRAN and the EPC. M1 is a user plane interface between E-UTRAN and EPC. It is also considered as a reference point.

## 3.2 Symbols

For the purposes of the present document, the following symbols apply:

*Symbol format (EW)*

<symbol> <Explanation>

## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in TR 21.905 [1].

| | |
|---|---|
| DiffServ | Differentiated Service |
| eNB | E-UTRAN Node B |
| EPC | Evolved Packet Core |
| E-UTRA | Evolved UTRA |
| E-UTRAN | Evolved UTRAN |
| GTP | GPRS Tunnelling Protocol |
| IP | Internet Protocol |
| MBMS | Multimedia Broadcast Multicast Service |
| TCP | Transmission Control Protocol |
| TEID | Tunnel Endpoint Identifier |
| UDP | User Datagram Protocol |

# 4 Data Link Layer

The support of any suitable data link Layer technique - like Ethernet, etc …- techniques shall not be prevented.

# 5 M1 interface user plane protocol

## 5.1 General

Editor"s Note: General description for user plane protocol, including protocol stack and identification of MBMS data stream.

The transport layer for MBMS data streams over M1 is an IP based Transport. The following figure shows the transport protocol stacks over M1.

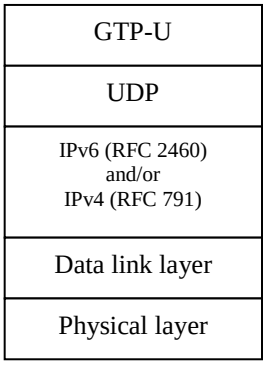


**Figure 5.1-1: Transport network layer for MBMS data streams over M1**

The GTP-U [2] protocol over UDP over IP shall be supported as the transport for MBMS data streams on the M1 interface. The data link layer is as specified in clause 4.

On IP multicast mode, the transport bearer is identified by the GTP-U TEID [2] and the IP multicast address (source TEID, source IP multicast address, IP multicast group).

## 5.2 GTP-U

Editor"s Note: It is needed to confirm if GTP-U is agreed for M1.

Editor"s Note: Description of GTP-U protocol (if necessary).

The GTP-U [2] protocol shall be used over the M1 interface toward the EPC.

## 5.3 UDP/IP

Editor"s Note: Description for UDP and IP protocol, including support of IP version and IP multicast protocol (if necessary).

Editor"s Note: It is expected that security aspect of IP multicast will be captured in TS36.440 General Aspect (if necessary).

The path protocol used shall be UDP [3].

The UDP port number for GTP-U shall be as defined in [2].

eNB and EPC shall support fragmentation and assembly of GTP packets at the IP layer.

The eNB and EPC shall support IPv6 [5] and/or IPv4 [6].

IP multicast [7, 8] shall be supported for point-to-multipoint delivery of MBMS data streams for multi-cell transmission.

The packet processing function in the EPC shall send MBMS data of a given MBMS bearer to the TNL IP multicast address associated to that particular MBMS bearer or the eNB IP address associated to that particular MBMS bearer.

## 5.4 Diffserv code point marking

Editor"s Note: Description for diffserv code point marking (if necessary).

IP Differentiated Services code point marking [4] shall be supported. The mapping between traffic categories and Diffserv code points shall be configurable by O&M based on QoS Class Identifier (QCI) Characteristics and other E-UTRAN traffic parameters. Traffic categories are implementation-specific and may be determined from the application parameters.

# Annex A (informative): Change history

| TSG # | TSG Doc. | CR | Rev | Subject/Comment | New |
|---|---|---|---|---|---|
| 2009-10 | | | | First draft | 0.0.0 |
| 2009-11 | | | | Capture the agreements in RAN3#66 | 1.0.0 |
| 2009-12 | | | | Presented for approval at RAN#46 | 2.0.0 |
| 46 | RP-091255 | | | Approved at RAN#46 | 9.0.0 |

# History

| Document history | | |
|---|---|---|
| V9.0.0 | February 2010 | Publication |
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